

E 295879
CT 1992

(12) UK Patent Application (19) GB (11) 2 095 879 A

- (21) Application No 8105383
 (22) Date of filing 20 Feb 1981
 (43) Application published 6 Oct 1982
 (51) INT CL³
 G01D 1/00
 (52) Domestic classification
 G4D 401 411 423 AX
 (56) Documents cited
 GB 1500509
 (58) Field of search
 G4D
 (71) Applicants
 Group NH Limited,
 George V. Place,
 4 Thames Avenue,
 Windsor,
 Berkshire SL4 7BH.
 (72) Inventors
 Helene Nova Hopkins,
 Norman Keith Hopkins.
 (74) Agents
 Abel and Imray,
 Northumberland House,
 303-306 High Holborn,
 London WC1V 7LH.

(54) Cost display device

(57) Apparatus for providing a consumer with a continuous readout of a cumulative total of the cost of electricity, gas or other metered commodity consumed. Includes a sensor device (2) consisting of a light emitting diode and photo-detector combination or a magnetic sensor which can be fitted into position on the transparent case of the meter to monitor the movement of a dial or wheel on the meter. The sensor

device is coupled to a reader unit (1) that contains a micro computer. This times the interval between successive outputs of the sensor device and from this computes the total amount of a commodity used and using tariff parameters computes the cost. This is then displayed on a numeric display. Other facilities include entering a target consumption figure, monitoring compliance with the target, and assessing the consumption of a single appliance. A bar code reader may be used to update the tariff rates.

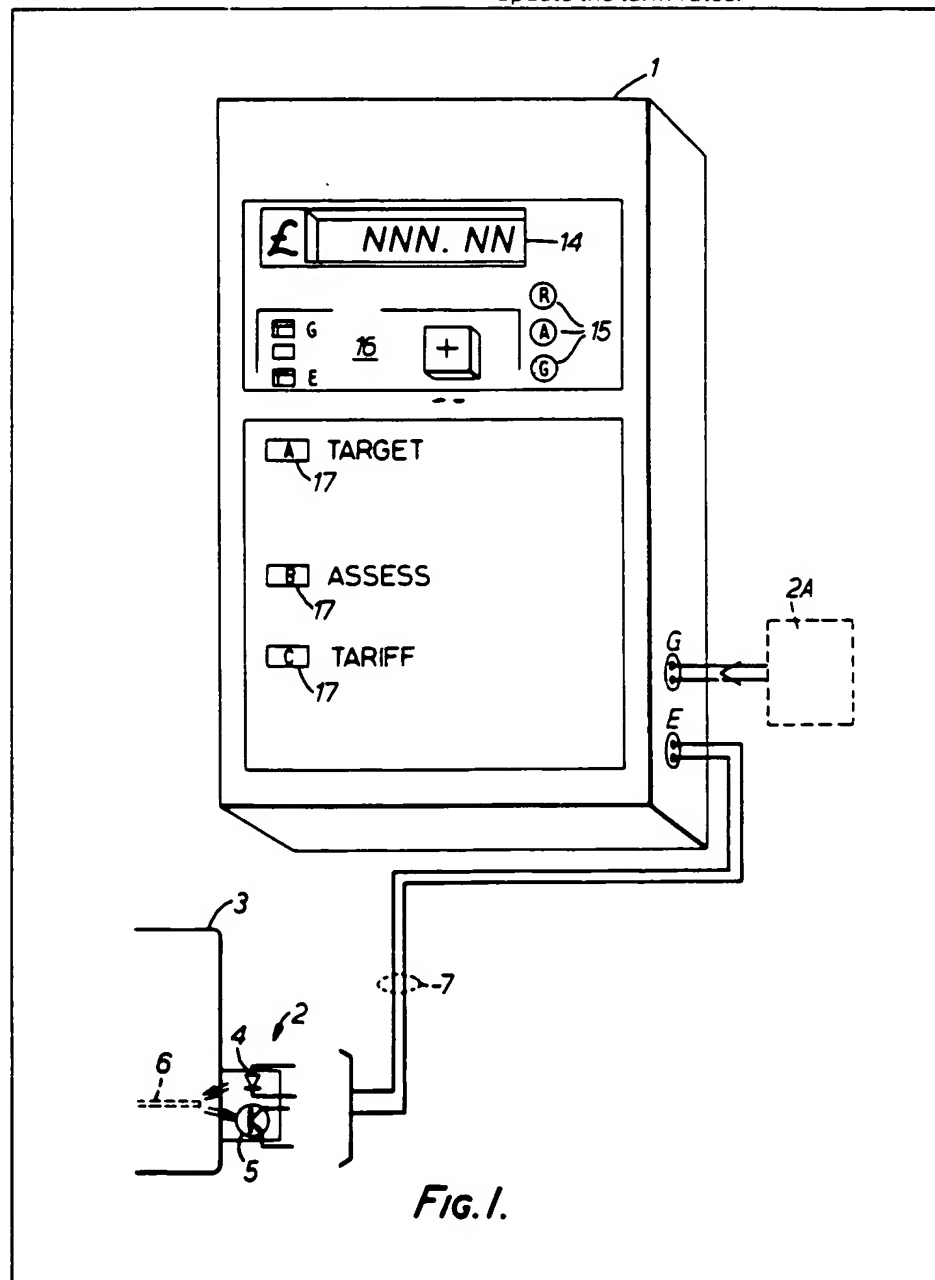


Fig. 1.

GB 2 095 879 A

BEST AVAILABLE COPY

unit for the meter - taking account of variables such as calorific value. (5 digits)

- B. Meter standing charge per 13 weeks. (4 digits)
- C. Number of units at standard rate. (2 digits)
- 5 D. Price per unit at standard rate. (4 digits)
- E. Price per unit in excess of those of standard rate. (4 digits)
- F. Surcharge factor, if any. (4 digits)
- G. Factor to which surcharge applies, if any. (1 digit)
- 10 H. Maximum price per unit, if any. (4 digits)
- J. Maximum charge per unit, if any. (4 digits)
- K. Scalar factor. (1 digit)
- L. Rate of VAT. (2 digits)
- 15 M. Factors to which VAT applicable. (1 digit)
- N. Reserved. (14 digits)

Instead of optical sensor devices as described above the sensor devices may be magnetic. They could consist of hall effect devices and maybe placed
 20 on the casing of the meter being monitored to detect movement of an internal paddle such as is present in a gas meter. A similar device could be used to monitor flow meter of the type used for district heating or of the type used for monitoring the supply
 25 of oil to an oil fired heating system. In place of hall effect devices it is envisaged that inductively operated magnetic sensors may be used. It should also be appreciated that any number of sensor devices can be used so that simultaneous monitoring of
 30 electricity, gas, hot water for district heating and oil can be achieved with a single reader unit. It is also envisaged that commodities other than energy commodities be monitored, for example water.

35 CLAIMS

1. Apparatus for providing a consumer with an indication of the use of electricity, gas or other metered commodity including coupling means for
 40 coupling the apparatus to an installed consumer's meter and indicator means connected to the coupling means for providing an indication of the accrued cost of the metered commodity since a particular time.
- 45 2. Apparatus according to claim 1 wherein the coupling means includes a light source and photo-detector.
3. Apparatus according to claim 1 wherein the coupling means includes a magnetic sensor for
 50 example a hall effect device or coil.
4. Apparatus according to claim 1, 2 or 3 wherein the coupling means is adapted to be able to couple to at least two meters metering separate commodities.
- 55 5. Apparatus according to claim 4 wherein the indicator means provides an indication of the total of all the commodities monitored.
6. Apparatus according to any preceding claim wherein the indicator means is arranged to produce
 60 an indication of whether the rate of the consumer's consumption of the commodity is within a pre-selected target rate.
7. Apparatus according to claim 6 wherein the

within a target band, one of which lights when the rate is below the target band and one of which lights when the consumption is above the target band.

8. Apparatus according to claim 7 wherein the
 70 target band extends up to $3\frac{1}{2}\%$ each side of the target rate.

9. Apparatus according to any preceding claim wherein there is provided means for updating tariff parameters in the indicator means including a
 75 bar-code reader.

10. Apparatus according to any preceding claim wherein the metered commodity is selected from a group consisting of electricity, gas, water, heat (district heating), oil and coal dust.

80 11. Apparatus for providing a consumer with an indication of the use of electricity, gas or other metered commodity substantially as herein described with reference to the accompanying drawings.

Printed for Her Majesty's Stationery Office, by Croydon Printing Company Limited, Croydon, Surrey, 1982.
 Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

1/2

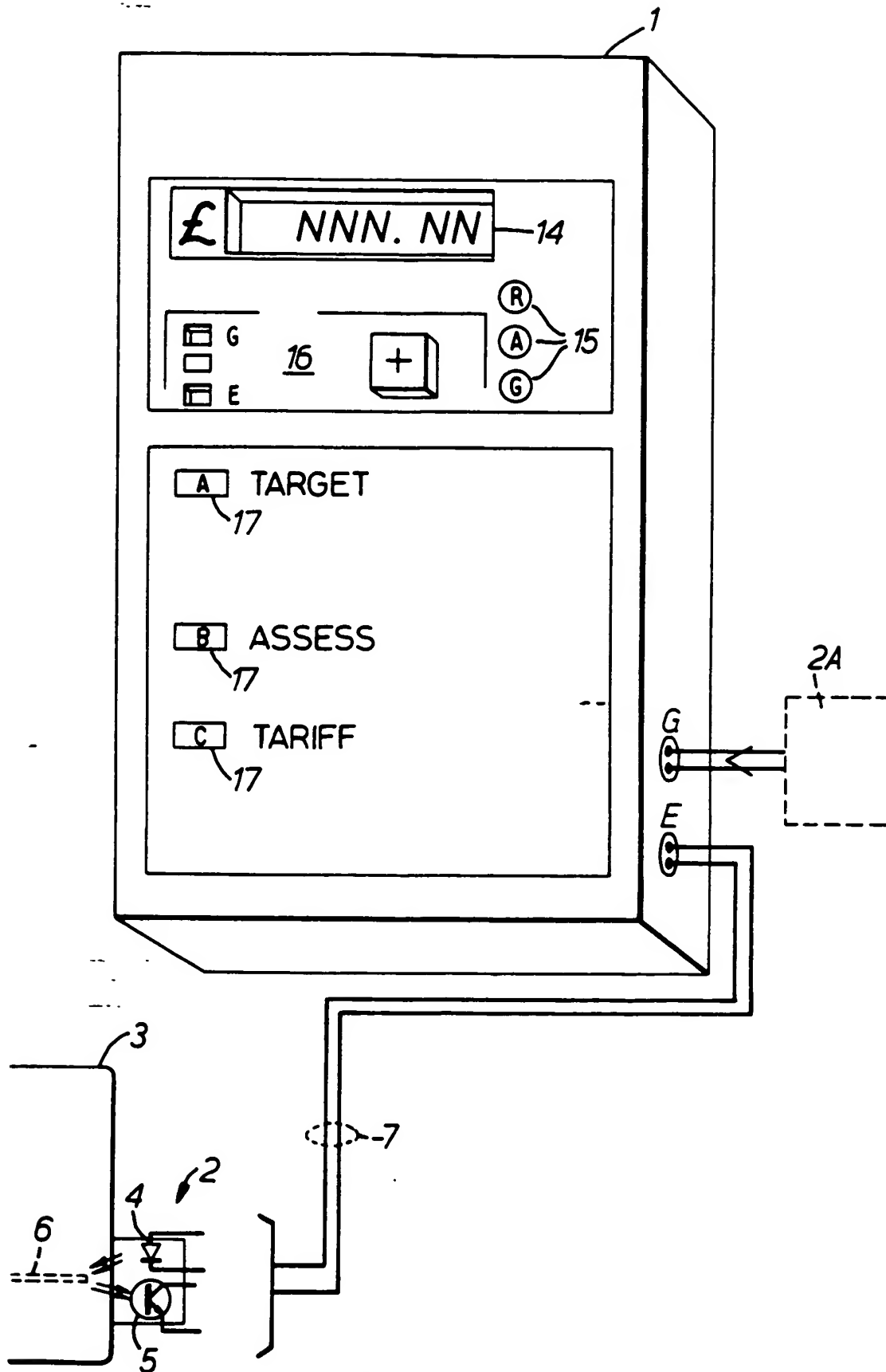


FIG 1



**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☒ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☐ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☐ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.